



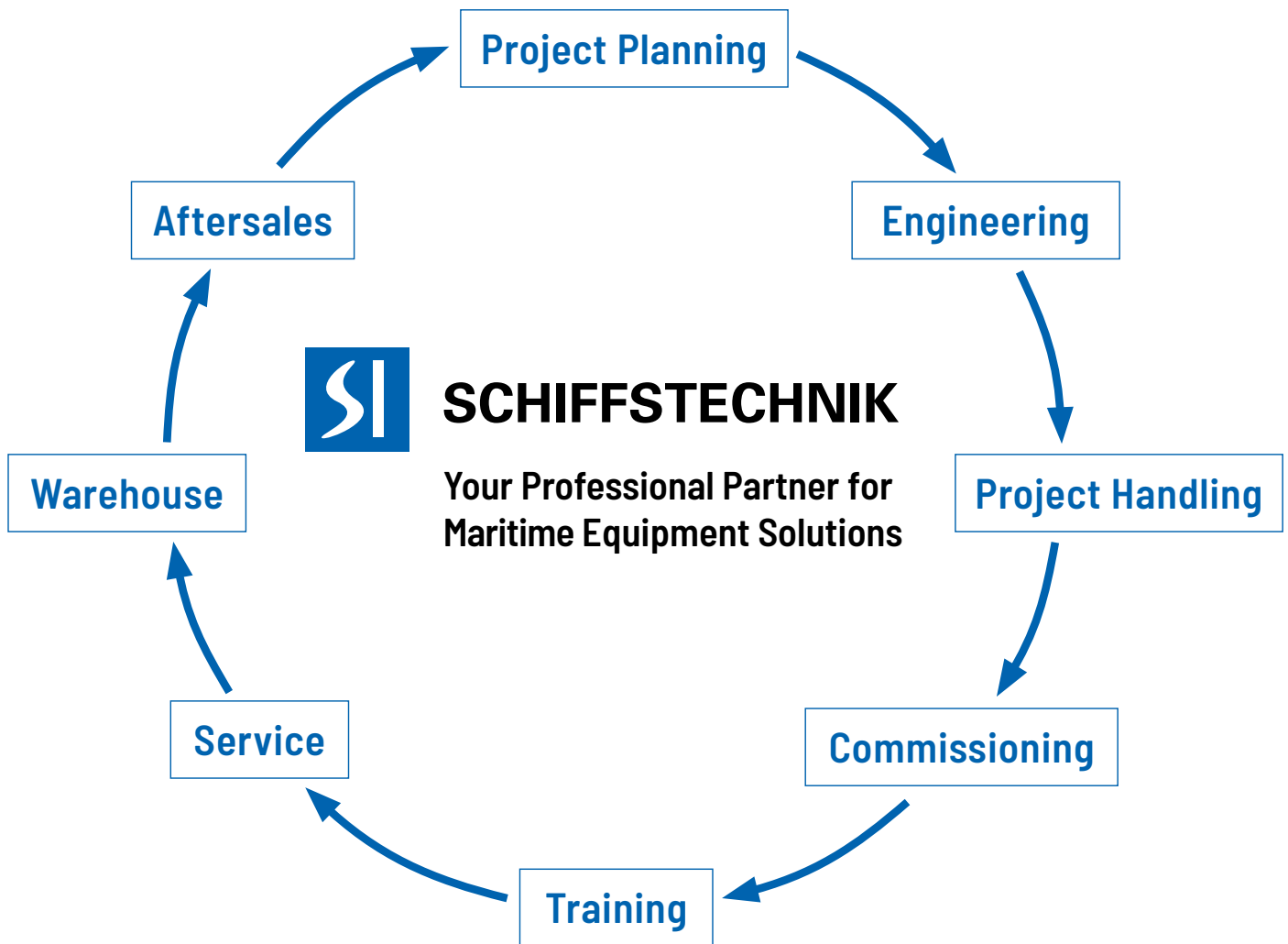
SCHIFFSTECHNIK

Maritime Equipment from a Single Sales and Service Partner



- **Manoeuvring**
- **Propulsion**
- **Vacuum Sanitary Systems**
- **Water Treatment**

House of Maritime Brands



Our Services Throughout the Product Life Cycle

We offer customized project handling, technical support for the products we sell, certified service and original spare parts:

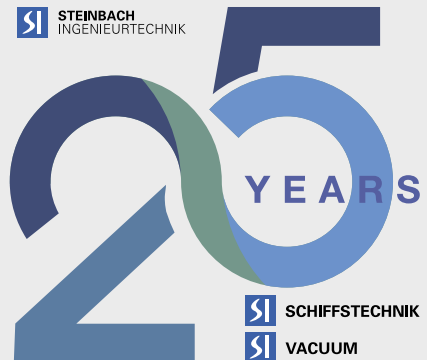
- Project planning to identify the right products
- Engineering to find the right technical solution for your specification from our broad portfolio
- Project management throughout the inquiry and order phase
- Commissioning at shipyards and during sea trials
- Operator training on board
- Maintenance and repair services
- Stock of spare parts and special tools
- Aftersales service for the entire life cycle of the vessel

About SI Schiffstechnik

SI Schiffstechnik is the exclusive representative of high-profile maritime equipment manufacturers.

The company was established in 1998. Our team brings a wide range of both maritime education and professional experience to any project: from Naval Architect, Marine Engineers with years of seafaring experience to Ships Machinery Constructors and highly experienced Ships Mechanics.

Our maritime background allows us to be an equal partner in experience and technical expertise to shipowners, shipyards and designers and this is the cornerstone to our business and success.



Our Portfolio

Propulsion

- Brunvoll AS - Propulsion, manoeuvring, dynamic positioning, automation & control
- HamiltonJet - Superior waterjets for fast, agile and efficient vessels

Water Treatment and Vacuum Sanitary Systems

- Jets Vacuum AS - Smarter sanitary systems for any vessel, wastewater treatment systems
- Poloplast GmbH & Co. KG - PP based vacuum pipe system and fittings approved for marine use - works perfectly with Jets Vacuum AS
- Norwegian Greentech AS - Compact ballast water management systems from 25 m³/h to 1.274 m³/h, suitable for smallest spaces

A special feature

When the unexpected happens, we are part of the Brunvoll 24/7 service support that offers:

- Highly trained field service technicians around the world
- Service engineers available at short notice
- Spare parts in stock for fast delivery
- Special tools available

News

In 2023 we became the exclusive sales and service partner for HamiltonJet in Germany, Austria and German-speaking Switzerland.



Brunvoll Develops Systematically Into a Package Supplier



Brunvoll Headquarters, Molde, Norway

About BRUNVOLL

With 110 years of history and industry experience, Brunvoll offers much more than the well-known thrusters. Brunvoll has challenged the industry with continuous development and innovation. On the harsh Norwegian coastline, Brunvoll develops and tests the next generation of technology for a greener maritime world.

Brunvoll's product portfolio has expanded rapidly over the last decade with new thruster variants, shaftline propulsion solutions, electric & hybrid systems, and automation & control. Dynamic Positioning Systems are the latest proof.

The introduction of the state-of-the-art DP system as a completely new product is nothing less than an impressive market transformation, offering the shipping industry a long-awaited, powerful alternative to existing systems.

Who else has that kind of innovation power?

Manoeuvring

Tunnel Thruster

A true Brunvoll standard, designed for the most demanding requirements.



Modell	Propeller diameter [mm]	Power range [kW]
FU 37	850	75 - 200
	1.000	100 - 250
FU 45	1.225	185 - 300
	1.375	275 - 450
FU 63	1.550	400 - 700
	1.750	600 - 950
FU 74	2.000	800 - 1.400
FU 80	2.250	1.000 - 1.500
FU 93	2.500	1.400 - 2.200
FU 100	2.750	1.800 - 2.500
FU 115	3.000	2.500 - 3.500
FU 135	3.500	3.700 - 5.000

Low Noise Tunnel Thruster

Resiliently mounted with full length double tunnel results in a noise reduction of 11 to 15 dB(A).



Modell	Propeller diameter [mm]	Power range [kW]
FU 37	1.000	100 - 250
FU 45	1.375	200 - 450
FU 63	1.750	400 - 900
FU 74	2.000	800 - 1.400
FU 80	2.250	1.000 - 1.500
FU 93	2.500	1.500 - 2.200
FU 100	2.750	1.800 - 2.300
FU 115	3.000	2.500 - 3.500

Rim Driven Thruster RDT

Electrically driven with a permanent magnet (PM) motor.



Modell	Propeller diameter [mm]	Power range [kW]
RDT 800	800	100 - 200
RDT 1000	1.000	200 - 300
RDT 1250	1.250	300 - 450
RDT 1500	1.500	400 - 600
RDT 1800	1.800	700 - 1.000
RDT 2100	2.100	1.000 - 1.600

Low Noise RDT Tunnel Thruster

Resiliently mounted with full length double tunnel, results in a noise reduction of 15 to 19 dB(A).



Modell	Propeller diameter [mm]	Power range [kW]
RDT 800	800	100 - 200
RDT 1000	1.000	200 - 300
RDT 1250	1.250	300 - 450
RDT 1500	1.500	400 - 600
RDT 1800	1.800	700 - 1.000
RDT 2100	2.100	1.000 - 1.600

Retractable Azimuth-Combi Thruster

Works as a tunnel thruster in upper position and as an azimuth thruster in lower position.



Modell	Propeller diameter [mm]	Power range [kW]
AR 63	1.750	500 - 880
AR 80	2.100	1.000 - 1.500
AR 100	2.600	1.800 - 2.500
AR 115	2.900	2.500 - 3.500

Retractable Azimuth Thruster

For dynamic positioning, manoeuvring, slow speed propulsion and as standby & „take home“ propulsion thruster. Available in shock qualified design.



Modell	Propeller diameter [mm]	Power range [kW]
AR 63	1.650	500 - 880
AR 80	2.100	1.000 - 1.500
AR 100	2.600	1.800 - 2.500
AR 115	2.900	2.500 - 3.500

Propulsion



CP Propeller

Optimized for the specific vessel to obtain highest efficiency. Propeller blades of NiAlBronze and Propeller hub of stainless steel as standard. Feathering propellers and Fixed Pitch propellers are also available.

Brunvoll CP Propeller Range	
Hub Size	520 - 1.950 mm
Propeller diam.	2.000 - 9.000 mm
Power Range	1.000 - 20.000 kW



Contra Rotating Propeller (CRP)

Contra Rotating Propeller. FP propellers individually driven through a unique shaft in shaft system. Drive can be any type of electric motor.

Total power (kW)	Propeller diameter (m)
1.500	2,3
2.000	2,7
2.500	3,0
3.000	3,3
3.500	3,6
4.000	3,8
4.500	4,0
5.000	4,2
5.500	4,4



Propulsion Azimuth Thruster, Pull Open

Slim, streamlined gearbox for maximum propulsion efficiency. Substantial rudder area for optimal steering capacity and course stability.

Modell	Propeller diameter [mm]	Power range [kW]
PU 74	1.900 - 2.200	750 - 1.200
PU 84	2.150 - 2.450	1.000 - 1.700
PU 93	2.400 - 2.750	1.400 - 1.850
PU 105	2.600 - 2.900	1.800 - 2.600
PU 115	2.900 - 3.300	2.200 - 3.500



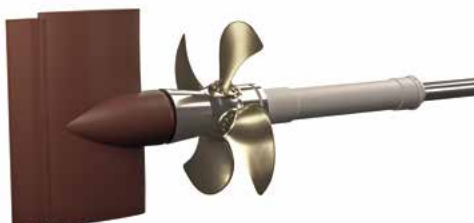
Propulsion Azimuth Thruster, Push Ducted

Emphasize on maximum propulsion efficiency, bollard pull and optimal DP capability.

Modell	Propeller diameter [mm]	Power range [kW]
AUP 63	1.650	400 - 680
AUP 74	1.900 / 2.100	750 - 1.200
AUP 84	2.100 / 2.300	1.000 - 1.700
AUP 93	2.400 / 2.600	1.400 - 1.850
AUP 105	2.600 / 2.750 / 2.900	1.600 - 2.600
AUP 115	2.900 / 3.050 / 3.200	2.200 - 3.500

Integrated Costa Propulsion

Brunvoll Integrated Costa Propulsion. Twisted leading-edge rudder with Costa bulb and hub cap. Various rudder types available on request.



Propeller Nozzles

Brunvoll High Efficiency nozzle for improved bollard pull and speed. 19A and other nozzle profiles are available. A ducted propeller gives up to 30 % higher thrust at low speed compared to an open propeller.



BRUNVOLL – Innovative Solutions for Efficient Propulsion & Manoeuvring

In addition to their well-known thrusters, Brunvoll offers a comprehensive product range and are a world leading manufacturer for:

- Electric & Hybrid
- Control & Automation
- Propulsion
- Manoeuvring

Discover the wide product range from BRUNVOLL

Reduction Gearboxes

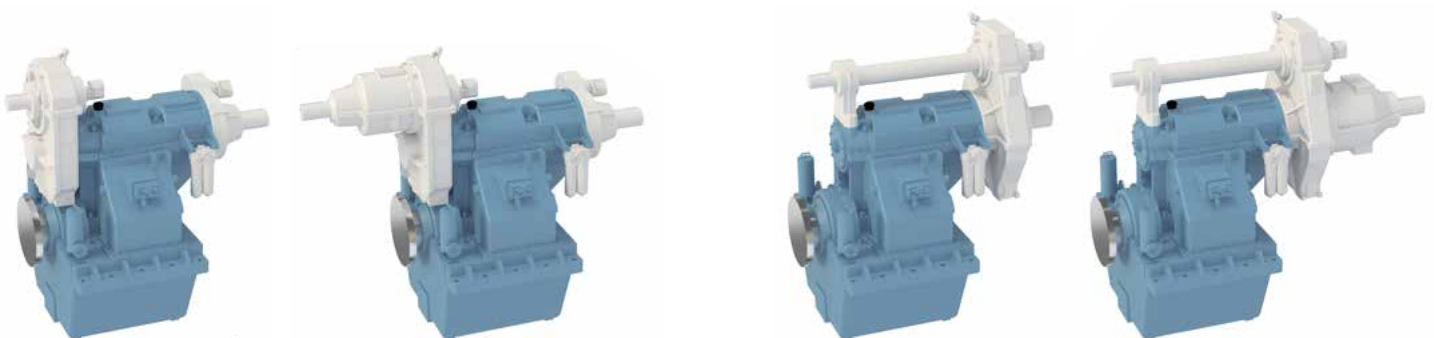
All Brunvoll gearboxes are customized for various operational modes. A wide range of gearbox models and configurations are available in power range up to approx. 20.000 kW output range.

Power range may vary due to operating condition, required reduction ratio, and Class notations.

Various gearbox models and sizes for

- Single and two steps reduction
- 2-speed gearboxes for 2 different propeller rpm optimized for the actual operation profile
- Vertical or horizontal offset
- Twin-in single-out gearboxes, allowing for high flexibility ideal for hybrid systems with multiple engine configurations

Brunvoll customized gearboxes are based on a module-based design concept with a wide range of possible PTO/PTI modules to each gearbox. The PTO/PTI can be primary or secondary driven, with or without integrated clutch. All gearboxes are designed with high quality components, and white metal slide bearings on both input and output shafts to ensure reliability during the gears' entire lifetime.



Secondary driven
PTO/PTI without clutch

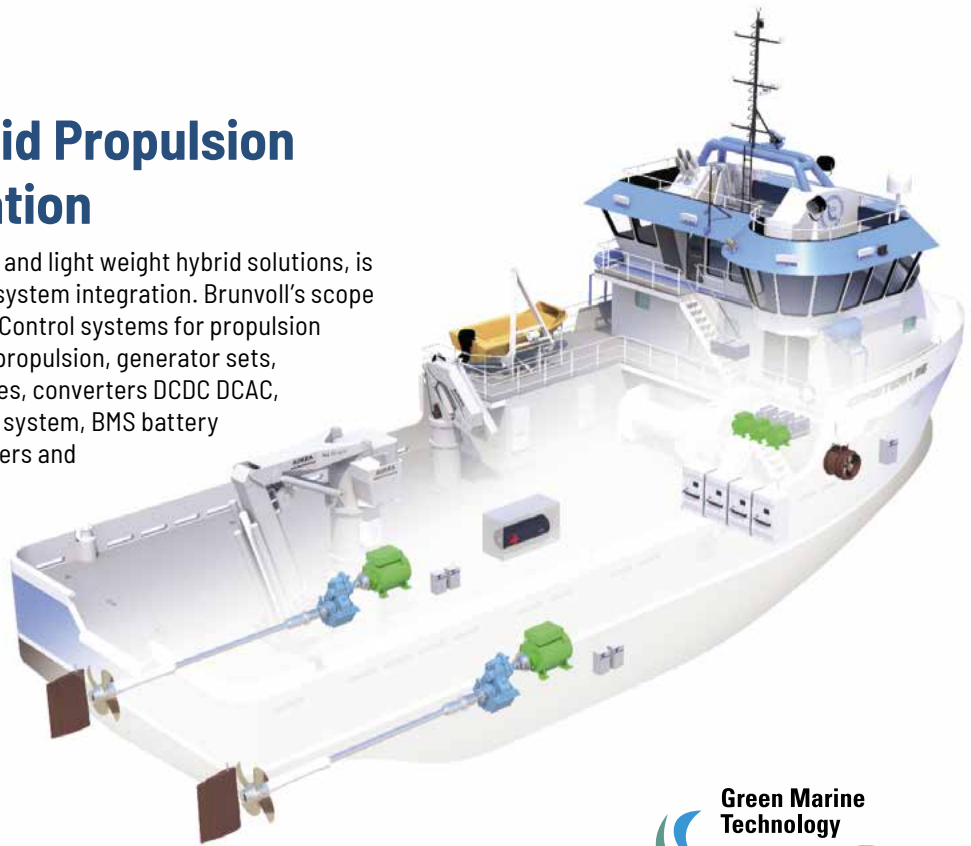
Secondary driven
PTO/PTI with clutch

Primary driven
PTO/PTI without clutch

Primary driven
PTO/PTI with clutch

Electric & Hybrid Propulsion System Integration

Brunvoll, specialized in compact and light weight hybrid solutions, is taking full responsibility for the system integration. Brunvoll's scope of supply in System Integration: Control systems for propulsion and manoeuvring, E-motors for propulsion, generator sets, battery package, frequency drives, converters DCDC DCAC, Triton-EMS energy management system, BMS battery management system, transformers and charging systems.

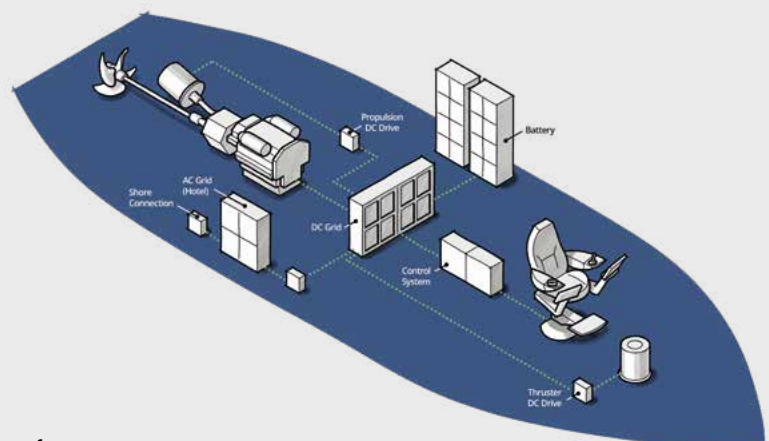


Brunvoll Scope of Supply in System Integration

- Control systems for propulsion and manoeuvring
- Generator / El. motors for propulsion
- Generator sets
- Battery package
- Frequency drives
- Converters DCDC DCAC
- Brunvoll Triton-EMS energy management system
- Battery system with BMS
- Transformers
- Charging system

Power Range

Brunvoll has realized electric and hybrid drive systems from 2 x 90 kW electric motors up to 2 x 1.100 kW electric motors.



Control & Automation



BruCon Condition Monitoring System

Online support 24/7. Keeps owners and crew informed of the condition of vital propulsion units and manoeuvring thrusters via a web dashboard.



BruCon Control System

For all types of propulsion and thruster system configurations:
 CP- or FP-propeller, CRP, propulsion azimuth thrusters, retractable azimuth thrusters, single and/or multiple tunnel thrusters.



BruCon DP & Joystick Control Systems

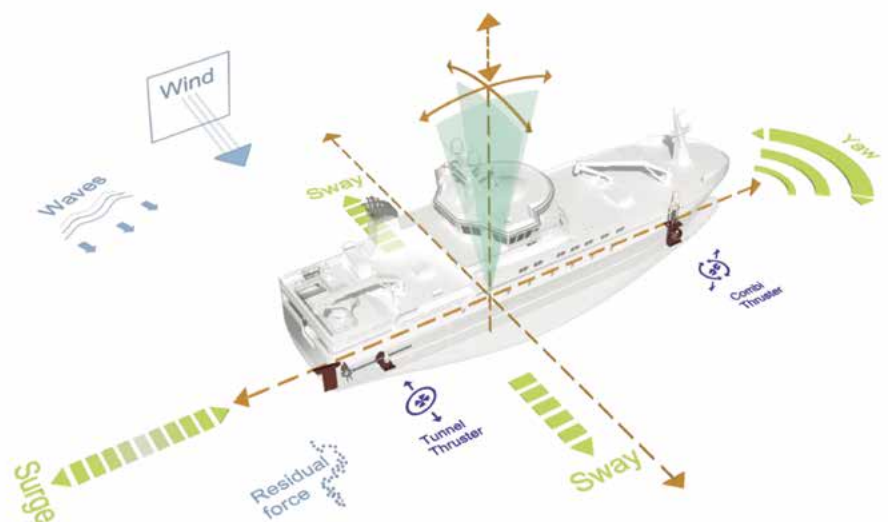
Dynamic Positioning & Joystick systems for all types of propulsion and thruster configurations. BruCon DP automatically maintains a vessel's position and heading by using its propellers and thrusters.

A Completely new Dynamic Positioning System

Brunvoll's starting point for developing a new Dynamic Positioning System from the ground up was recruiting experienced engineers, develop a modular hardware platform based on state-of-the-art system architecture, and develop software based on modern algorithms. Some team members have long experience in the development and delivery of DP systems.

Development Results

- The result is a state-of-the-art Brunvoll DP-system
- A lean, user friendly system with all the necessary functions
- A lean system is surprisingly easy to use
- A team with more than 20 years of experience in the DP industry
- A young development team that is open to ideas, friendly and cooperative



Pioneer and Marketleader in Waterjets



About HamiltonJet

HamiltonJet is a New Zealand company based in Christchurch. In 1954 HamiltonJet pioneered the first commercial waterjet. Fast forward 70 years and HamiltonJet remains a market leader in waterjets and vessel controls.

All R&D and manufacturing is done in-house in a modern facility with state of the art machining facilities, including in-house foundries for casting both stainless steel and aluminum, and extensive testing and inspection procedures. With over 440 employees worldwide, a global network of three regional offices in Europe, Asia and the Americas, and 55 distributors, HamiltonJet is the largest manufacturer of waterjet propulsion systems.

Why Waterjets?

Waterjets are used when high speed, high acceleration, agile maneuverability or use in shallow water is required. Jets are optimized for a speed range of 0-40 knots and reach a top speed of approximately 60 knots.

Jet Types Descriptions



HJ SERIES



HJ Series

The HamiltonJet HJ Series of waterjets has been proven over many years to perform under all operating conditions, providing superior thrust, efficiency and cavitation performance. The current HJ series includes integrated features such as intake and transition duct for easy installation, as well as steering and reverse components.



HM SERIES



HM Series

HM waterjets provide highly efficient propulsion for high-speed vessels operating in the world's most demanding marine environments.



HT SERIES



HT Series

Developed from the highly successful HamiltonJet HM line of waterjets, the HT Series waterjets feature improved efficiency and cavitation performance. HT Series waterjets feature a mixed flow pump with a larger nozzle to inlet ratio than similar size axial flow waterjets. This provides high efficiency over the entire vessel speed range.



HAMILTONJET

HJX
SERIES

HJX Series

The HJX Series is the next generation of the world's most popular HJ waterjet. Featuring a hydrodynamic design for increased efficiency and materials, the HJX offers exceptional control and ease of installation, making it the most durable and powerful waterjet yet.



HAMILTONJET

HTX
SERIES

HTX Series

The HTX jets feature new hydrodynamics and advanced materials for redefined performance. The HTX series delivers between 5% and 7% more thrust at higher speeds. HTX jets are also capable of achieving speeds more than 55 knots when matched with suitable engines and hull design. HTX jets feature brand new cavitation resistant intake and pump designs. These deliver up to 40% more bollard pull.

Jet Types Technical Datas

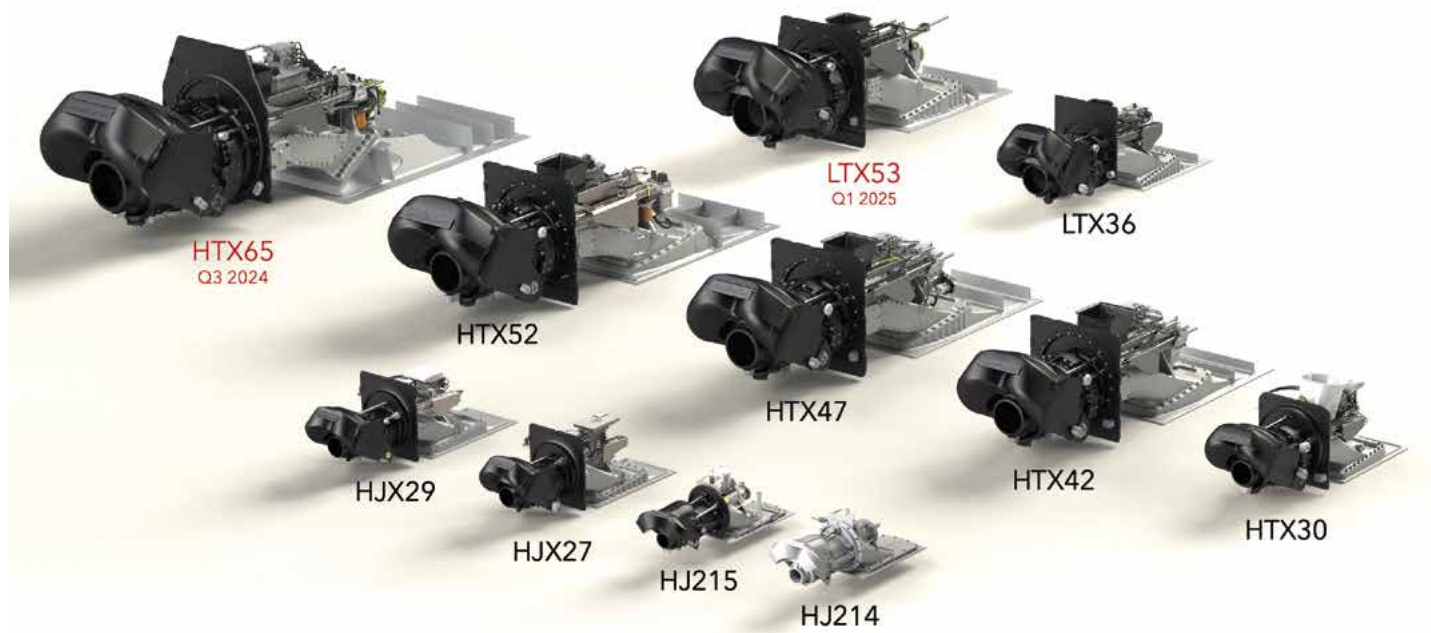
The current HamiltonJet waterjet range includes models with power ratings from 150kW to 5.500kW for vessels typically up to 90 meters in length.

5.5 to 18 m Type	kW
HJ212	260
HJ213	260
HJ241	260
HJX27	353
HJX29	440
HJ322	500
HTX30	570
HJ364	670
HJ403	900
HJ422	1.000

18 to 50 m Type	kW
HTX42	1.300
HTX47	1.630
HTX52	1.950
HM651	2.200
HM721	2.700
HM811	3.500

40 to 90 m Type	kW
HT810	4.000
HT900	5.000
HT1000	5.500

Low Speed Series Type	kW
LTX36	310



HamiltonJet fitted more than 60.000 waterjets into vessels over the last seven-plus decades. Innovation is a key to success. The illustration shows the latest and planned newly developed water jet types.

Focus on Performance

Performance Estimate

The PE combines hull resistance and jet thrust. The point where these curves intersect is the estimated speed of the boat. Based on boat data, engine type and target speed, we use the PE to compare and decide the suitability of different jets for different boat weights.

Customized design at the price of a standard product

Each series in the finely graded waterjet portfolio can be combined with up to 7 impeller options. This results in many possible variations. Thanks to the many possible combinations, customers get a de facto custom design at the price of a series product.

Ideal match between waterjet and engine

Customization allows for an ideal match between the waterjet and the engine to take full advantage of the engine's power. This results in long engine life and low fuel consumption.

High customer satisfaction

A conservative performance estimate ensures that the shipyard will reliably meet the customer's specifications. The yard is likely to deliver a little more than specified. This increases customer satisfaction and loyalty.

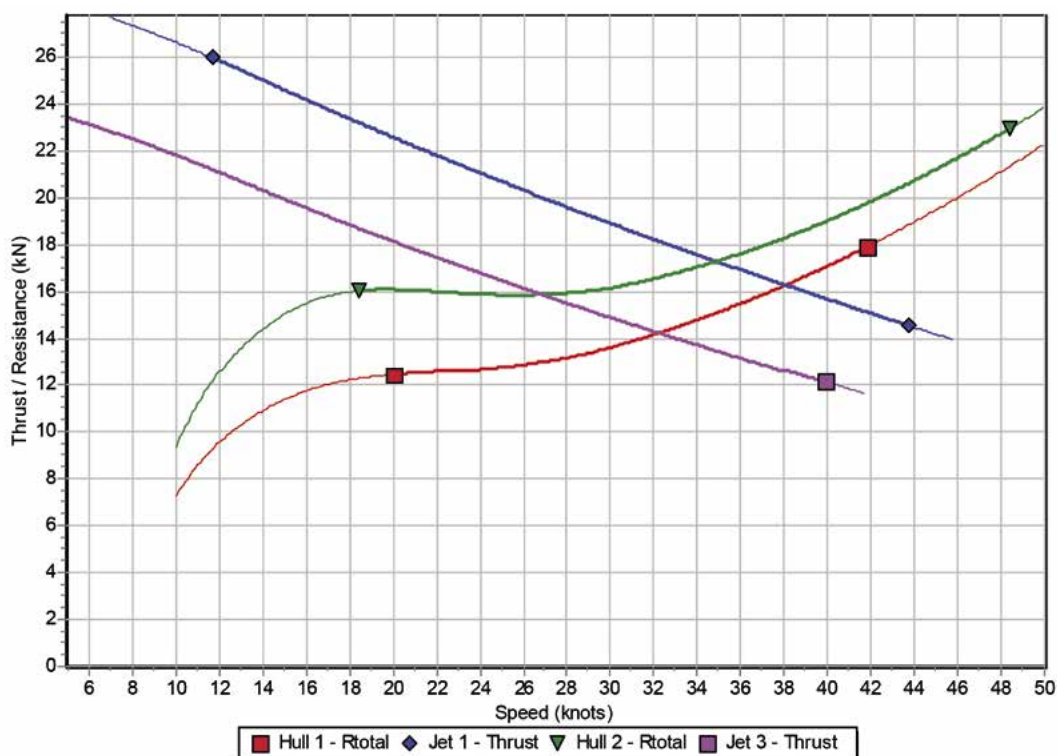
The PE helps in the design phase

The hull resistance curve consists of three segments separated by two nodes. The thin portion of the resistance curve indicates the uncertainty of the curve's validity. The thin portion of the curve at the high end of the speed range indicates the point at which the trim flattens out at high speed and the sides of the hull are likely to run wet.

The PE shows three parts of a thrust curve for a given HamiltonJet. A valid performance estimate is obtained where the hull resistance curve intersects the valid portion of a thrust curve. The thin part of the thrust curve shows the low-speed cavitation zone, the speed at which cavitation would occur at full power. And it shows the high-speed zone where the thrust drops off. At this point, the jet nozzle speed and the boat speed are approximately equal.

Extra weight increases hull resistance. The single biggest factor in underperforming jet boats is the unwanted increase in displacement.

Performance Estimate of a 12m Rescue Vessel



The Waterjet Reimagined – LTX Series

High efficiency

The LTX Series is highly efficient in low to medium speed applications from 0-30 knots. Its compact design allows a larger diameter jet to fit into narrow hulls, while its lower input power performance allows it to remain lightweight and operate at a lower cost.

High Bollard Pull

Performance LTX jets deliver up to 40% more bollard pull and greater sway thrust than any other waterjets on the market. This best-in-class bollard pull improves manoeuvring response, position holding capability and vessel acceleration.

Safety and shallow water

Due to their design and inboard impeller, our jets can operate in shallow water. This also makes them safe for swimmers and marine life such as whales.

Electronic Controls

LTX is designed to work with AVX and AVXexpress.



Advanced vessel controls

HamiltonJet designs and manufactures hydraulic and electronic controls for all waterjet models. The electronic controls can be integrated with a variety of other vessel systems, including engine and gearbox controls, autopilots, voyage data recorders, and dynamic positioning systems to provide complete maneuvering control.

Hydraulic components are built into the waterjet and can be operated from the helm via manual cables, a hydraulic control system, or the AVX or AVXexpress electronic control systems.

AVX and AVXexpress

The AVX platform is a modular system that can be cost-effectively scaled. AVX is for larger boats and AVXexpress is for smaller boats.

AVX can be configured for two to six control stations and drive two to six waterjets. AVXexpress can be configured for two

control stations and two waterjets. With either system, you can choose from a variety of control options: full helm, mini-helm, joystick or Mouseboat/3-axis controller.



EHX – Electric hybrid drive

All-electric and hybrid drive technologies are ideal for waterjet applications.

With EHX, we provide the electric motors, power electronics and control system, as well as the expertise to ensure seamless integration with the waterjets, engines, gearboxes or clutches.

The control system manages the hybrid energy flow between motors, batteries and motors, charging and discharging the batteries as needed.

The EHX is scalable to your vessel project with engines, battery capacity and components selected specifically to meet your needs.

EHX Operating Modes

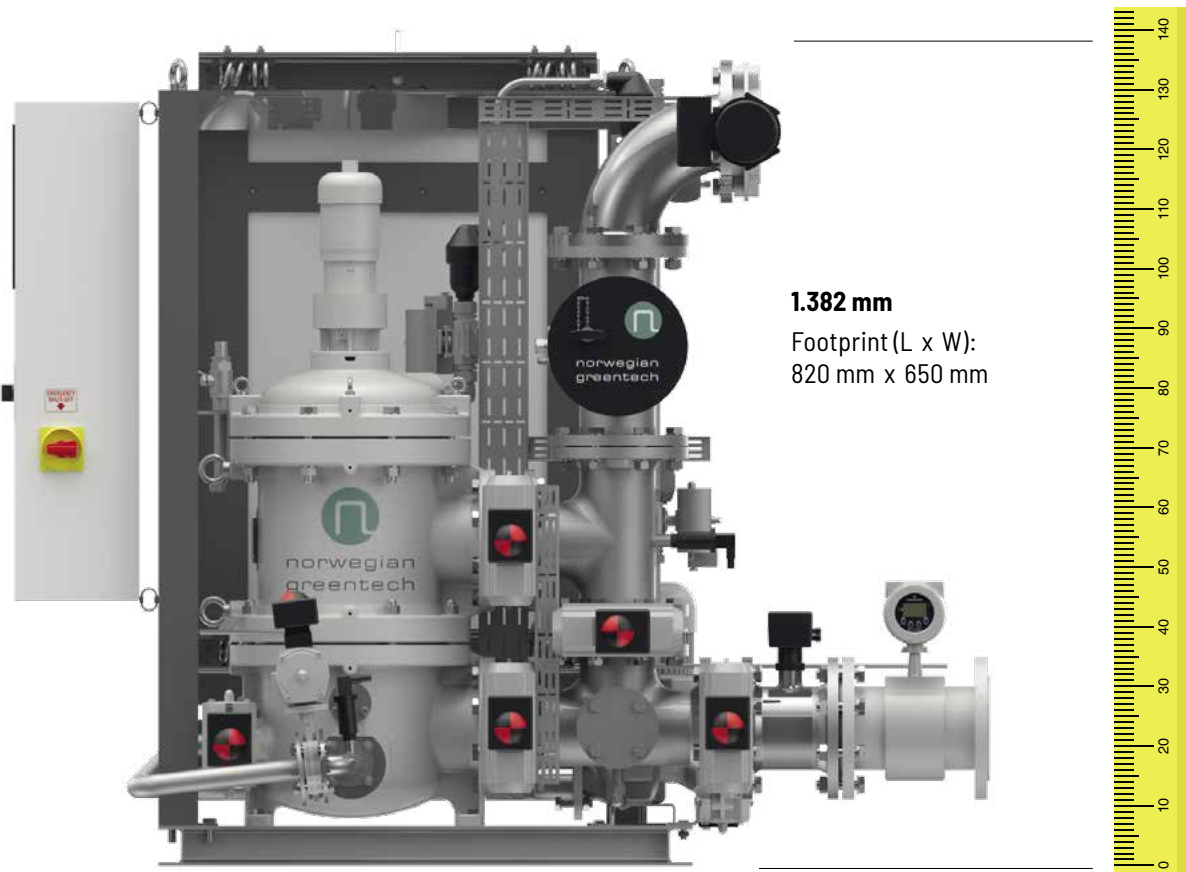
- Electric only
- Diesel only
- Charging
- Electric boost

Hybrid Options

As an electric hybrid integration specialist, you can choose the level of support you'd like from us.



The Most Compact Ballast Water Management System on the Market



About Norwegian Greentech AS

Norwegian Greentech AS, formerly MMC Green Technology AS, has a proven track record in process water treatment for live fish carriers and landbased aquaculture. NGT is an industry pioneer in small footprint Ballast Water Management Systems who understood early the ship owners' demanding requirements in the field.

Their pool of skilled water treatment specialists have over 20 years of industry-defining expertise.

SI Schiffstechnik GmbH & Co. KG is the certified sales and service provider of almost a decade.

Based on a Two-Step Process

First Step:

Pre-Treatment-Filtration

On intake the ballast water is filtered and particles and larger microorganisms are removed.

- Self-cleaning filter
- Mesh size 20 µm
- Automatic backwash process
- Low pressure loss
- High reliability for uninterrupted and trouble-free operation



Second Step:

UV-Disinfection

Norwegian Greentech BWMS use UV-disinfection, which has been tried and tested for more than 100 years. The latest UV-technology, based on medium UV-radiation, is the most efficient UV-technology for Ballast Water Management.

The underlying effect of UV light is to damage the microorganism's genetic material while acting as a germicide to attack biomolecules inside microorganisms.

- No active substances (chemical agents such as chlorine or chlorine dioxide)
- Also disinfection of chlorine-resistant pathogens
- Does not generate harmful residual substances, no undesirable disinfection-by-products (DBPs)
- No requirement for additional after-treatment
- No risk of over- or underdosing
- UV is the only system that has the ability to disinfect during deballasting

Capacities

Norwegian Greentech AS offers various models depending of UV-T, flow and the operation pattern.

The TRC's (Treatment Rated Capacity) are split up in 3 groups.

Small

25 to 204 m³/h



Medium

204 to 750 m³/h



Large

750 to 1.274 m³/h



Advantages

- Compact system with a small footprint
- Of great advantage to reach small installation sites for retrofits
- Modular design on a skid or loose delivery enables flexible installation and simplifies retrofitting
- Chemical free - no dangerous active substances
- Does not require any consumables
- Low power consumption and low operation costs
- Fully automated, Plug & Play
- Type Approval Certificate from DNV. The BWMS complies with IMO Resolution MEPC.300(72)
- Certificate of Approval from United States Coast Guard (USCG)

A Smarter Sanitary System for any Vessel



About Jets®

Jets® is a global company that develops, manufactures and sells vacuum toilets, vacuum systems and treatment plants. The company is headquartered in Hareid, Norway.

Jets® helps save the planet by reducing the world's water and energy consumption. A Jets® vacuum system makes it easy to cleanly separate gray and black water. Both can then be sent for specialized treatment, recycling or disposal.

- 90% less water consumption and wastewater
- Robust Norwegian quality since 1986
- Reliable operation with fewer parts, fewer breakdowns
- Easy to install

Vacuamarator® Pumps by Jets®

The unique Vacuamarator® pump is the heart of every Jets® system. It creates the vacuum, macerates the sewage, and discharges it - all in a single pass.

Jets® vacuum systems are powered by Jets® unique pumps, the renowned Vacuamarator®. The energy efficient Vacuamarator® is very small, compact and robust compared to other systems. It can pump fluids directly to collecting tanks, treatment plants or sewers and can also be used for discharge or transfer.



Jets® Edge Small

13 m³/h
50% vacuum
50Hz
37 kg
557 x 214 x 273 mm
(LxWxH)



Jets® Edge Medium

30 m³/h
50% vacuum
50Hz
63,5 kg
719 x 206 x 318 mm
(LxWxH)



Jets® Edge Large

62 m³/h
50% vacuum
50Hz
91 kg
820 x 262 x 361 mm
(LxWxH)



Jets® Edge Extra Large

78 m³/h
50% vacuum
50Hz
98 kg
863 x 262 x 358 mm
(LxWxH)

Wall-Mounted Vacuum Toilets

Jets® 59M

Jets® 59M, the classic model, features a flush ring and a soft-closing seat and cover.



Jets® Charm

Jets® Charm features nozzle flushing, low water consumption and a soft-closing seat and cover.



Jets® 609SS

The Jets® 609SS is a lightweight, stainless steel vacuum flush toilet with a soft-closing seat and cover.



Jets® Jade Wall

Jets® Jade Wall Softsound™ is designed for easy maintenance and features a quick and quiet closing seat and cover.



Jets® Opal - USPA

Jets® OPAL - USPA is an electronic bidet equipped with USPA. It has a warm water nozzle, heated seat, deodorizer, dryer and an intelligent energy saving function.



Jets® Pearl

Jets® Pearl is a nozzle-flush toilet with an ergonomic design and a soft-closing seat and cover.



Floor/Deck-Mounted Vacuum Toilets

Jets® Jade Floor

Jets® Jade Floor Softsound™ has a flush ring with nozzles, and quick and a quiet closing seat and cover.



Jets® 55M

Jets® 55 features a flush ring, compact design, and soft-closing seat and cover.



Jets® 50M

Jets® 50M, the classic model, comes with a soft-closing seat and cover. It has a flush ring and low water consumption.



Jets® 610SS

The Jets® 610SS is a stainless-steel vacuum toilet. It features jet flushing and a soft-closing seat and cover.



All toilets offer

- Water savings, using only one liter of water required per flush
- Flexible installation: Vertical and horizontal pipes
- Reliable operation
- Hygienic

Reduce Maintenance Time with our RagBox™

With the new and revolutionary RagBox™, trapped objects can be easily and quickly removed before entering the vacuum piping system. Easy access to the hook reduces operation time from 10 minutes to seconds. Compatibility with the Jets® descale dosing unit simplifies maintenance and saves you valuable time.



Vacuamarator® Units

Four different sizes of vacuum units are available, one for each size of our Vacuamarator® pumps (S, M, L, XL) and can be supplied with one, two or three pumps (mono, duo, trio). The units are available with three different control options, Basic, Advanced and VSD.



- Added redundancy
- Increased vacuum generation capacity
- Operational reliability
- Automated monitoring and control of vacuum levels

Ecomotive® Sewage Treatment Plants

Based on the same MBBR (Moving Bed Bio Reactor) technology, both Ecomotive® STP Compact and Ecomotive® STP Flex by Jets® are space efficient, safe and environmentally friendly.



Ecomotive® STP Flex Benefits

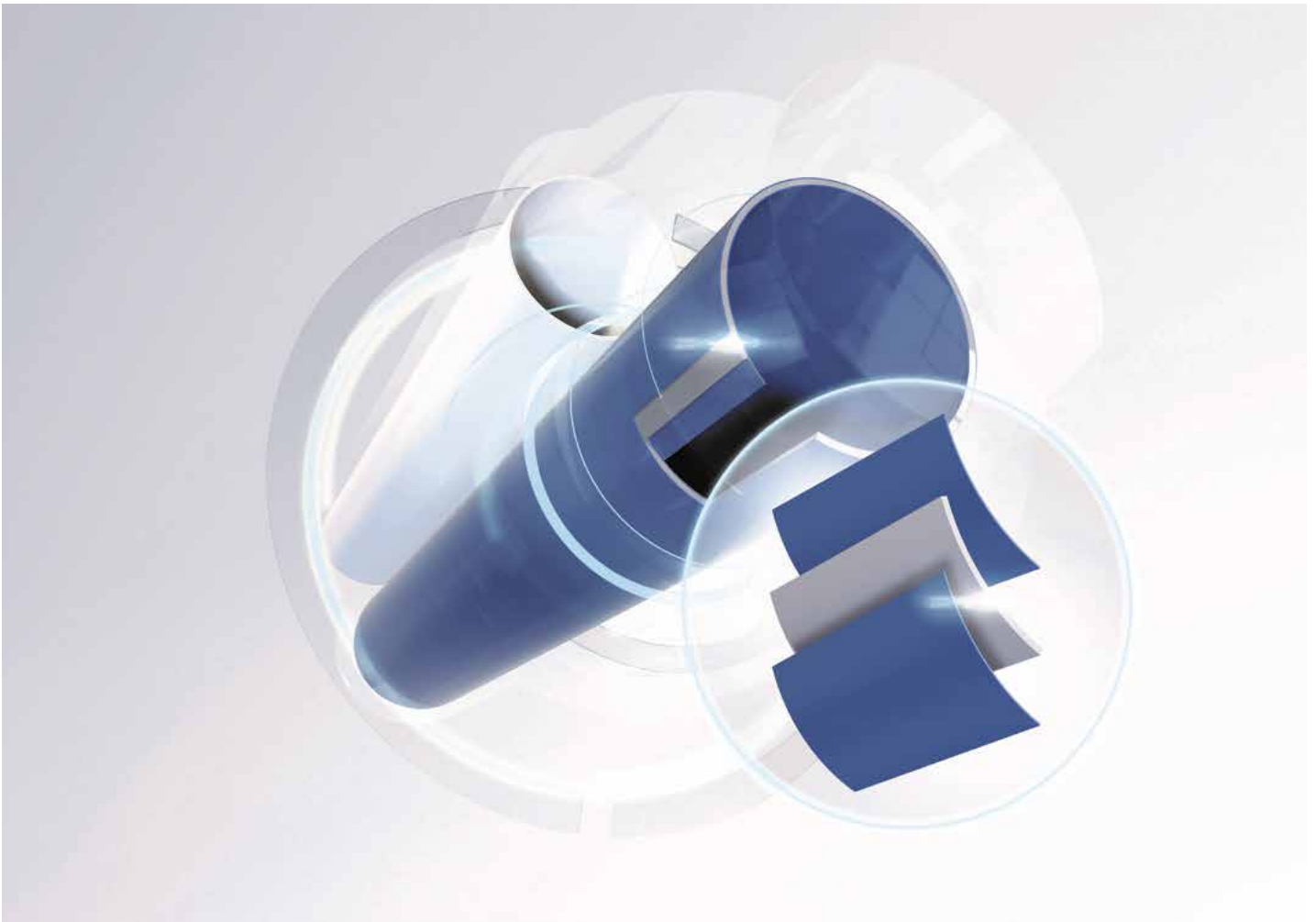
- Material Stainless Steel
- Available in 14 different sizes and capacities
- Modular design: inlet tank, treatment plant and Vacuamarator® pumps can be installed in separate locations
- USCG type approved range
- Self-cleaning due to the continuous movement of biofilm carriers
- UV light disinfection
- Automatic sludge removal eliminates a dirty job for the crew
- Maceration feed pump



Ecomotive® STP Compact Benefits

- Choice of stainless steel or black steel
- Available in four different sizes
- Air distribution pipes accessible from the outside for easy maintenance
- Automatic sludge removal
- Access to all chambers through hatches on the top of the STP
- The STP tanks are raised on legs for complete emptying. This allows for tank disinfection to improve system hygiene and crew safety, while preventing corrosion attacks on the bottom of the STP (black steel finish)
- Self-cleaning through continuous movement of biofilm carriers
- UV light disinfection
- Automatic sludge removal eliminates a dirty job for the crew
- Maceration feed pump

Vacuum Pipes - Three Layers for Eternity



About Poloplast

POLOPLAST GmbH & Co KG is an Austrian company with headquarters in Leonding. POLOPLAST develops, produces and sells reinforced, multi-layer plastic pipe systems. The innovative pipe systems have proven themselves in modern and sustainable applications for more than 60 years.

The three-layer, reinforced polypropylene (PP) vacuum piping system is suitable for both black and grey water applications.

- Marine approval
- Three-layer technology
- Soundproofing
- Low weight
- Easy to install

Couplings

Coupling POLOPLAST PP pipes

The POLO-KAL NG is a dismantlable and reusable push-fit pipe system. It's really easy to assemble; It's really easy to install; always use an appropriate lubricant when making the pipe connection.

Connecting POLOPLAST pipes to flanged fittings or components

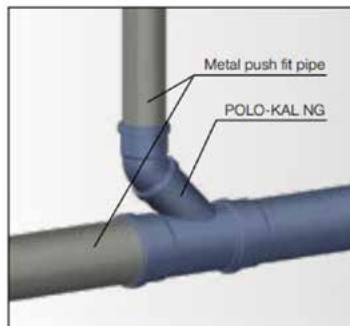
Flange couplings are used to connect PP with pipes of different materials and valves or other flanged fittings.

PP pipe coupling and threaded accessories

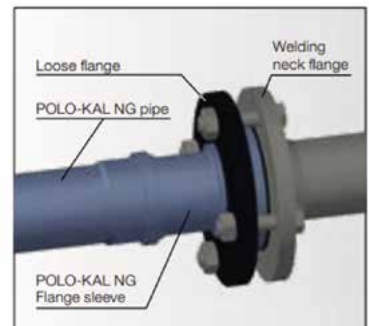
In some cases it is necessary to connect PP pipe elements to threaded fittings. Adapters are available in DN 40 and DN 50 with either male or female threads.

Push-fit connection

POLOPLAST offers push-in sleeves according to EN 1451-1 with factory-mounted EPDM lip seals.



The POLO-KAL NG Pipe system can be coupled to metallic push-fit pipe systems which have the same outer diameter.



By means of POLO-KAL NG Flange sleeve and loose flange. Suitable for coupling of POLOKAL NG pipe system and pipe systems of different materials.

Advantages over Stainless Steel Pipes

	POLP-KAL NG Vacuum	Stainless Steel Pipes	Advantages
Weight 3 m DN50	1,12 kg	3,8 - 6,4 kg (6,4 kg + 3,8 kg)/2 = 5,1 kg	Low weight material
Total weight 20 km	1,12 kg * 20.000 m / 3 m ≈ 7.500 kg	5,1 kg * 20.000 m / 3 m ≈ 34.000 kg	Save nearly 80 % of weight
System price factor (pipe, couplings, fasteners)	1	3	Pay three times less
Ease of installation and safety	Quick and secure push-fit system	Complex and error-prone gluing process	Save installation time
Installation flexibility	Quickly adjustable and expandable	Stiff and inflexible	Stay flexible while installation
Eco-friendliness	No toxic gases 100% recyclable	Toxic gases during the installation process (gluing)	Sustainable solution



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